

Gall Wasps of Oregon White Oaks

Description

Oregon white oaks (*Quercus garryana*) are home to hundreds of insect species. The majority of these insects use the oak tree without harming it. One example is the Gall wasps, or Cynipid wasps, which have an unusual relationship with our native oak trees.

Formation

The adult wasp lays its eggs in sprouting leaves or twigs. When the egg hatches, the larvae that emerge begin to feed on the tree. The larvae's saliva contains a special growth hormone that irritates the tree causing it to produce a gall - a kind of protective cover around the wasp larvae. The gall provides shelter and food for the larvae. Even though this is considered a parasitic relationship, as the wasp larvae lives and feeds off of the oak tree, very little to no harm, actually occurs to the tree.

Some galls have more than one larvae inside. Sometimes the one egg divides into several larvae, the same way humans have twins, triplets, etc., except that one wasp egg could divide up into 10-12 larvae. If you were to cut open one of these galls you might find a larvae inside. If no larvae appear within it, look at the outside of the gall, there will probably be a small hole from which the larvae exited.

Figure 2. Oak gall, *Andricus californicus*
(Kris Hoffmann)



Andricus californicus also called California Gallfly. After the female lays eggs on the stems, the eggs hatch and the tree forms a gall around the larva. Oddly, females in this species reproduce asexually and although the eggs are not fertilized, they still produce offspring. This type of reproduction is called parthenogenesis.

Types of Gall Wasps

There are 4 main types of wasps that cause common galls on Oregon white oak:

These galls are often called an oak apple. These galls are large, apple-like and persistent. The galls are the largest of the 4 different types found on the Oregon Oak and range from 1 to 4 inches in width. They begin as green in color and by late fall they will turn a brown-gray just before the wasp emerges. The wasp chews its way out the gall and as many as 12 wasp larvae can inhabit one gall. The development of the gall causes no damage to the oak tree and can be easily removed.

Bassetia ligni, causes small seed-like galls to be formed under the bark of oak branches which can girdle and kill the branch. This can be observed by clusters of dead leaves, however, no serious damage is caused to the oak tree.

Besbicus mirabilis, causes delicate mottled, spherical galls to be formed on the underside of oak leaves.

Neuroterus saltatorius, causes small mustard seed-like galls to appear on lower leaf surfaces. They form in midsummer or later and inside each gall is a tiny wasp larvae. When these galls fall off the leaves in the autumn they tend to jump an inch or more above the ground from the activity of the larvae inside. Even though the galls appear active at this time, the wasp larvae overwinter inside the galls on the ground. Females that emerge in the spring will then lay their eggs in the oak buds as they open. The larvae that emerge from these eggs cause blister-like galls to form, deforming the leaves. The adult females that emerge from these galls go on to lay their eggs elsewhere on other leaves. None of this activity causes any harm or damage to the oak tree.

Figure 1. Gall Wasps (Jim Burrows)



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Fun Facts

- Different galls can form on the same oak tree. Galls can occur on other plants as well, such as wild roses, and thimbleberries.
- The Cynipid wasp does not sting humans or other animals.
- Ink was made from wasp galls for centuries, even as far back as Pliny the Elder (a Roman naturalist and philosopher of the first century AD). It was also used as the ink for the Declaration of Independence. However, the ink used from oak galls did not come our Oregon oak, it was instead developed from the galls of European and eastern US species of oak.

Resources:

Bug Guide

<http://bugguide.net/node/view/613036>

Field Guide to Plant Galls of California and Other Western States, by Ron Russo

Galls, Oregon State University, from:

<http://extension.oregonstate.edu/sorec/galls>

http://extension.oregonstate.edu/yamhill/sites/default/files/Do_You_Know_What_Galls_Me.pdf

Pacific Northwest Insect Management Handbook (online.), C.S. Hollingsworth, editor, 2015. Corvallis, OR: Oregon State University,

<http://insect.pnwhandbooks.org/pacific-northwest-insect-management-handbook/citing-handbook>,

<http://insect.pnwhandbooks.org/node/6329/print>

The Declaration of Independence: A History, from:

http://www.archives.gov/exhibits/charters/declaration_history.html